Animal Waste Management Systems: Livestock

TS Goal: 30 systems

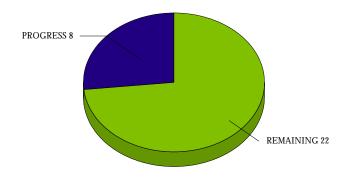
Definition: Systems for the proper handling, storage, and use of waste generated by confined animal facilities. These include ponds, lagoons, and tanks for liquid waste, and sheds or pits for solid waste.

Applied to: manure acres (stored manure) **Nitrogen Efficiency:** 75% reduction **Phosphorus Efficiency:** 75% reduction

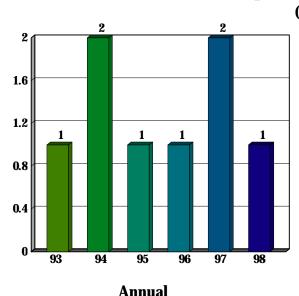
BMP Rankings:

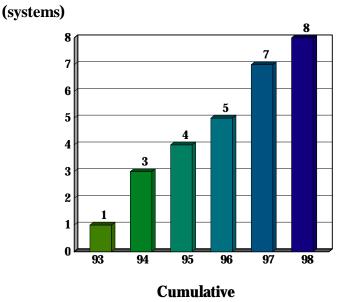
Ability to Reduce Nutrients: High **Importance in Statewide Strategy:**

Nitrogen - High **Phosphorus** - High



1998 Progress for Animal Waste Management
Systems: Livestock
(as a percentage of TS goal, labeled units are systems)





NOTES: (1) Implementation data is organized by State fiscal year (i.e. 1994 = July 1, 1993 - June 30, 1994). (2) Most implementation data is based on State program activities, funding and/or requirements. (3) BMP definitions are from "Maryland's Tributary Strategies for Nutrient Reduction" report, 1995. (4) BMP implementation data is from the Maryland Interagecy Tracking Subcommittee. (5) Efficiencies are average statewide efficiencies. (6) Ongoing improvements to the Watershed Model shift the expected reductions of BMPs with efficiencies listed as "land use conversions" slightly.

Conservation Tillage

TS Goal: 13,333 acres

Definition: A process that uses tillage equipment to seed the crop directly into the vegetative cover or crop residue on

the surface, with minimal soil disturbance.

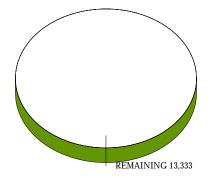
Applied to: hitill and lotill land

Nitrogen Efficiency: land conversion reduction **Phosphorus Efficiency:** land conversion reduction

BMP Rankings:

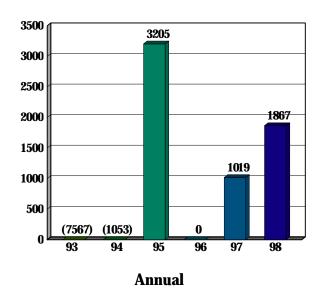
Ability to Reduce Nutrients: High **Importance in Statewide Strategy:**

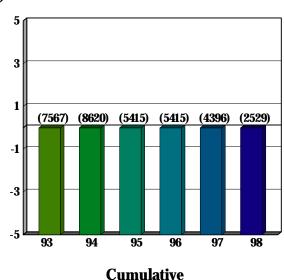
Nitrogen - High Phosphorus - High



1998 Progress for Conservation Tillage (as a percentage of TS goal, labeled units are acres)

Implementation Record





NOTES: (1) Implementation data is organized by State fiscal year (i.e. 1994 = July 1, 1993 - June 30, 1994). (2) Most implementation data is based on State program activities, funding and/or requirements. (3) BMP definitions are from "Maryland's Tributary Strategies for Nutrient Reduction" report, 1995. (4) BMP implementation data is from the Maryland Interagecy Tracking Subcommittee. (5) Efficiencies are average statewide efficiencies. (6) Ongoing improvements to the Watershed Model shift the expected reductions of BMPs with efficiencies listed as "land use conversions" slightly.

Cover Crops

TS Goal: 8,195 acres

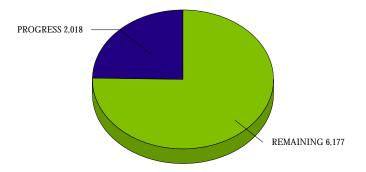
Definition: Small grains planted in September or early October on land otherwise fallow with no fertilizer applied. This practice reduces nitrate leaching losses during the winter, and also reduces erosion.

Applied to: hitill and lotill land **Nitrogen Efficiency:** 59% reduction **Phosphorus Efficiency:** 44% reduction

BMP Rankings:

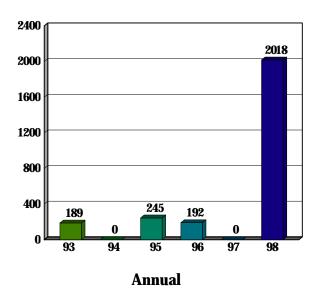
Ability to Reduce Nutrients: High Importance in Statewide Strategy:

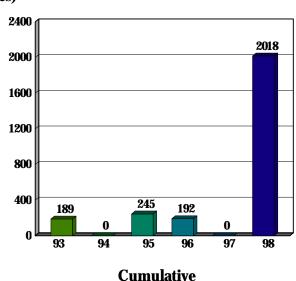
Nitrogen - High **Phosphorus** - High



1998 Progress for Cover Crops (as a percentage of TS goal, labeled units are acres)

Implementation Record





NOTES: (1) Implementation data is organized by State fiscal year (i.e. 1994 = July 1, 1993 - June 30, 1994). (2) Most implementation data is based on State program activities, funding and/or requirements. (3) BMP definitions are from "Maryland's Tributary Strategies for Nutrient Reduction" report, 1995. (4) BMP implementation data is from the Maryland Interagecy Tracking Subcommittee. (5) Efficiencies are average statewide efficiencies. (6) Ongoing improvements to the Watershed Model shift the expected reductions of BMPs with efficiencies listed as "land use conversions" slightly.

Nutrient Management Plan Implementation

TS Goal: 64,964 acres

Definition: A comprehensive plan to manage the amount, placement, timing and application of animal waste, fertilizer,

sludge, or other plant nutrients.

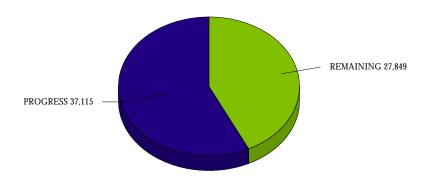
Applied to: cropland

Nitrogen Efficiency: model-derived reduction **Phosphorus Efficiency:** model-derived reduction

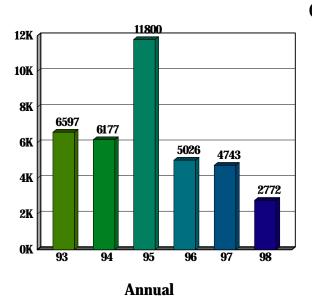
BMP Rankings:

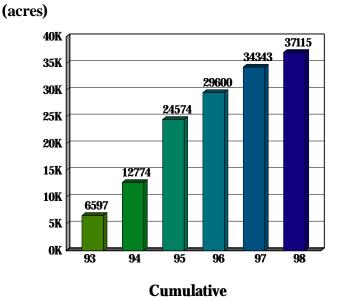
Ability to Reduce Nutrients: Medium **Importance in Statewide Strategy:**

Nitrogen - High Phosphorus - High



1998 Progress for Nutrient Management Plan
Implementation
(as a percentage of TS goal, labeled units are acres)





NOTES: (1) Implementation data is organized by State fiscal year (i.e. 1994 = July 1, 1993 - June 30, 1994). (2) Most implementation data is based on State program activities, funding and/or requirements. (3) BMP definitions are from "Maryland's Tributary Strategies for Nutrient Reduction" report, 1995. (4) BMP implementation data is from the Maryland Interagecy Tracking Subcommittee. (5) Efficiencies are average statewide efficiencies. (6) Ongoing improvements to the Watershed Model shift the expected reductions of BMPs with efficiencies listed as "land use conversions" slightly.

Retirement of Highly Erodible Land

TS Goal: 2,100 acres

Definition: An accelerated application of practices used in

SCWQPs on lands with a high potential for soil loss.

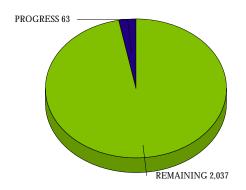
Applied to: cropland and pasture

Nitrogen Efficiency: land conversion reduction **Phosphorus Efficiency:** land conversion reduction

BMP Rankings:

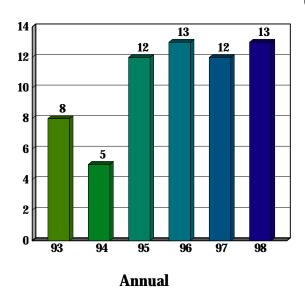
Ability to Reduce Nutrients: High Importance in Statewide Strategy:

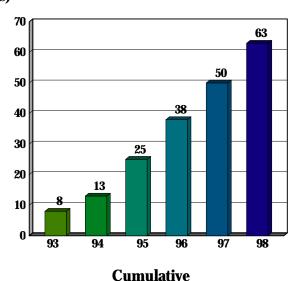
Nitrogen - Medium Phosphorus - Medium



1998 Progress for Retirement of Highly Erodible
Land
(as a percentage of TS goal, labeled units are acres)

Implementation Record





NOTES: (1) Implementation data is organized by State fiscal year (i.e. 1994 = July 1, 1993 - June 30, 1994). (2) Most implementation data is based on State program activities, funding and/or requirements. (3) BMP definitions are from "Maryland's Tributary Strategies for Nutrient Reduction" report, 1995. (4) BMP implementation data is from the Maryland Interagecy Tracking Subcommittee. (5) Efficiencies are average statewide efficiencies. (6) Ongoing improvements to the Watershed Model shift the expected reductions of BMPs with efficiencies listed as "land use conversions" slightly.

Runoff Control

TS Goal: 30 systems

Definition: Systems for the proper handling, storage, and use of waste generated by confined animal facilities. These include ponds, lagoons, and tanks for liquid waste, and sheds or pits for solid waste.

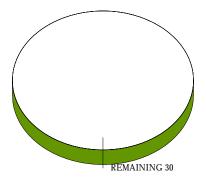
Applied to: manure

Nitrogen Efficiency: 10% reduction **Phosphorus Efficiency:** 10% reduction

BMP Rankings:

Ability to Reduce Nutrients: High **Importance in Statewide Strategy:**

Nitrogen - Medium **Phosphorus** - Medium



1998 Progress for Runoff Control (as a percentage of TS goal, labeled units are systems)

Implementation Record

(systems)

Annual Cumulative

SCWQP Implementation and Treatment of Highly Erodible Land

TS Goal: 36,530 acres

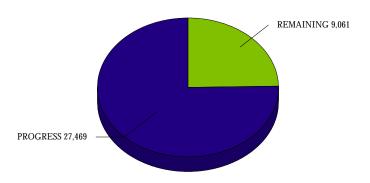
Definition: A comprehensive plan addressing natural resource management of farmland directed toward the control of erosion and sediment loss, and management of animal waste or agricultural chemicals.

Applied to: cropland and pasture **Nitrogen Efficiency:** 11% reduction **Phosphorus Efficiency:** 21% reduction

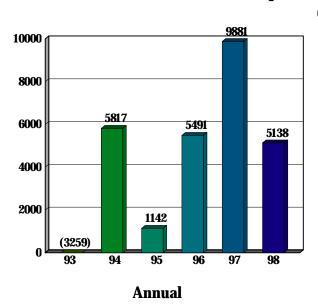
BMP Rankings:

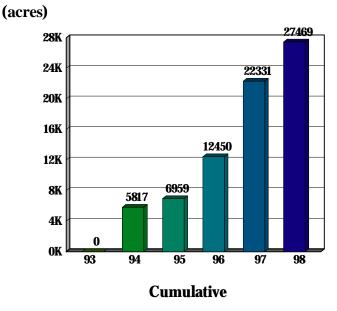
Ability to Reduce Nutrients: Low **Importance in Statewide Strategy:**

Nitrogen - High **Phosphorus** - High



1998 Progress for SCWQP Implementation and Treatment of Highly Erodible Land (as a percentage of TS goal, labeled units are acres)





NOTES: (1) Implementation data is organized by State fiscal year (i.e. 1994 = July 1, 1993 - June 30, 1994). (2) Most implementation data is based on State program activities, funding and/or requirements. (3) BMP definitions are from "Maryland's Tributary Strategies for Nutrient Reduction" report, 1995. (4) BMP implementation data is from the Maryland Interagecy Tracking Subcommittee. (5) Efficiencies are average statewide efficiencies. (6) Ongoing improvements to the Watershed Model shift the expected reductions of BMPs with efficiencies listed as "land use conversions" slightly.

Stream Protection with Fencing

TS Goal: 29 acres

Definition: Fencing along streams to completely exclude livestock from the stream. Also improves streambank

stability and reduces sedimentation.

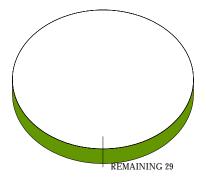
Applied to: pasture

Nitrogen Efficiency: 75% reduction **Phosphorus Efficiency:** 75% reduction

BMP Rankings:

Ability to Reduce Nutrients: High **Importance in Statewide Strategy:**

Nitrogen - Low Phosphorus - Low



1998 Progress for Stream Protection with Fencing (as a percentage of TS goal, labeled units are acres)

Implementation Record

(acres)

Annual Cumulative

Stream Protection without Fencing

TS Goal: 408 acres

Definition: Providing troughs or other watering devices in remote locations away from the stream to discourage animals from entering the stream, and the provision of some fencing adjacent to stream crossings to limit access points.

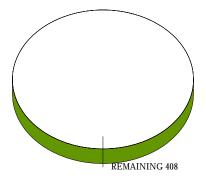
Applied to: pasture

Nitrogen Efficiency: 38% reduction **Phosphorus Efficiency:** 38% reduction

BMP Rankings:

Ability to Reduce Nutrients: Medium **Importance in Statewide Strategy:**

Nitrogen - Low Phosphorus - Low



1998 Progress for Stream Protection without Fencing (as a percentage of TS goal, labeled units are acres)

Implementation Record

(acres)

Annual Cumulative

Forest Conservation

TS Goal: 4,526 acres

Definition: Implementation of the Forest Conservation Act, which requires the retention of a portion of forested

lands on any newly developed site.

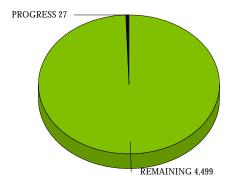
Applied to: urban land

Nitrogen Efficiency: land conversion reduction **Phosphorus Efficiency:** land conversion reduction

BMP Rankings:

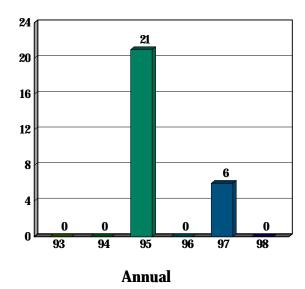
Ability to Reduce Nutrients: High **Importance in Statewide Strategy:**

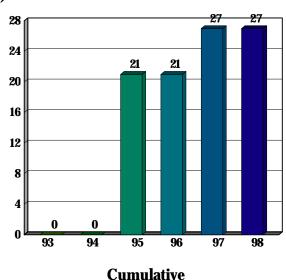
Nitrogen - Medium Phosphorus - Medium



1998 Progress for Forest Conservation (as a percentage of TS goal, labeled units are acres)

Implementation Record





NOTES: (1) Implementation data is organized by State fiscal year (i.e. 1994 = July 1, 1993 - June 30, 1994). (2) Most implementation data is based on State program activities, funding and/or requirements. (3) BMP definitions are from "Maryland's Tributary Strategies for Nutrient Reduction" report, 1995. (4) BMP implementation data is from the Maryland Interagecy Tracking Subcommittee. (5) Efficiencies are average statewide efficiencies. (6) Ongoing improvements to the Watershed Model shift the expected reductions of BMPs with efficiencies listed as "land use conversions" slightly.

Forest Harvesting Practices

TS Goal: 2,290 acres

Definition: Application of regulatory and voluntary best management practices applied to timber harvests, including erosion and sediment control and streamside management zones.

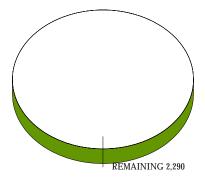
Applied to: forest land

Nitrogen Efficiency: 50% reduction **Phosphorus Efficiency:** 50% reduction

BMP Rankings:

Ability to Reduce Nutrients: Low Importance in Statewide Strategy:

Nitrogen - Low Phosphorus - Low



1998 Progress for Forest Harvesting Practices (as a percentage of TS goal, labeled units are acres)

Implementation Record

(acres)

Annual Cumulative

Forested Buffers

TS Goal: 18 acres

Definition: A linear strip of forest along rivers and streams that filters nutrients and sediment and enhances stream

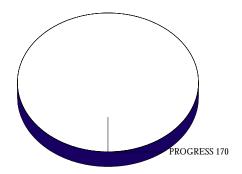
habitat.

Applied to: cropland and pasture **Nitrogen Efficiency:** 56% reduction **Phosphorus Efficiency:** 70% reduction

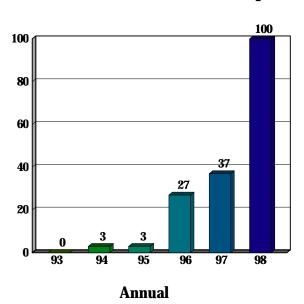
BMP Rankings:

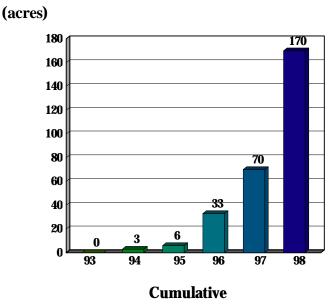
Ability to Reduce Nutrients: High **Importance in Statewide Strategy:**

Nitrogen - Medium Phosphorus - Medium



1998 Progress for Forested Buffers (as a percentage of TS goal, labeled units are acres)





NOTES: (1) Implementation data is organized by State fiscal year (i.e. 1994 = July 1, 1993 - June 30, 1994). (2) Most implementation data is based on State program activities, funding and/or requirements. (3) BMP definitions are from "Maryland's Tributary Strategies for Nutrient Reduction" report, 1995. (4) BMP implementation data is from the Maryland Interagecy Tracking Subcommittee. (5) Efficiencies are average statewide efficiencies. (6) Ongoing improvements to the Watershed Model shift the expected reductions of BMPs with efficiencies listed as "land use conversions" slightly.

Grassed Buffers

TS Goal: 412 acres

Definition: A linear strip of grass along rivers and streams that filters nutrients and sediment and enhances stream

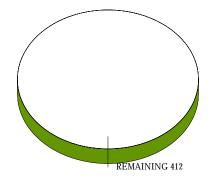
habitat.

Applied to: cropland and pasture **Nitrogen Efficiency:** 41% reduction **Phosphorus Efficiency:** 53% reduction

BMP Rankings:

Ability to Reduce Nutrients: High **Importance in Statewide Strategy:**

Nitrogen - Medium Phosphorus - Medium



1998 Progress for Grassed Buffers
(as a percentage of TS goal, labeled units are acres)

Implementation Record

(acres)

Annual Cumulative

Marine Pumpouts (installation)

TS Goal: 6 marinas

Definition: A facility sited at marinas for pumping sewage from boat holding tanks to a dockside storage facility.

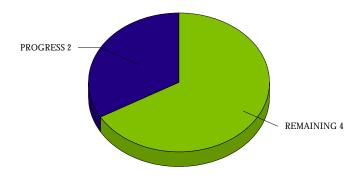
Applied to:

Nitrogen Efficiency: pound reduction Phosphorus Efficiency: pound reduction

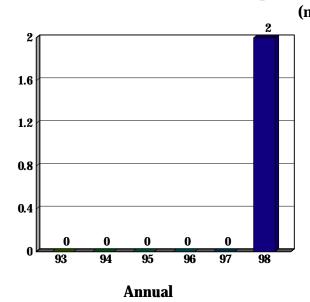
BMP Rankings:

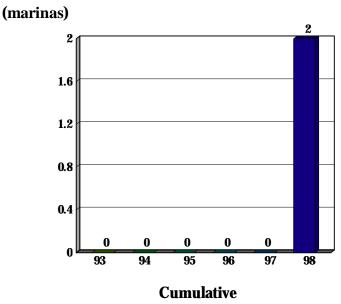
Ability to Reduce Nutrients: High **Importance in Statewide Strategy:**

Nitrogen - Medium Phosphorus - Medium



1998 Progress for Marine Pumpouts (installation) (as a percentage of TS goal, labeled units are marinas)





NOTES: (1) Implementation data is organized by State fiscal year (i.e. 1994 = July 1, 1993 - June 30, 1994). (2) Most implementation data is based on State program activities, funding and/or requirements. (3) BMP definitions are from "Maryland's Tributary Strategies for Nutrient Reduction" report, 1995. (4) BMP implementation data is from the Maryland Interagecy Tracking Subcommittee. (5) Efficiencies are average statewide efficiencies. (6) Ongoing improvements to the Watershed Model shift the expected reductions of BMPs with efficiencies listed as "land use conversions" slightly.

Nonstructural Shore Erosion Control

TS Goal: 11,850 linear feet

Definition: A practice for stabilizing eroding shorelines by establishing marsh grasses; suitable for sites with lower wave

energy. Also creates wetland habitat.

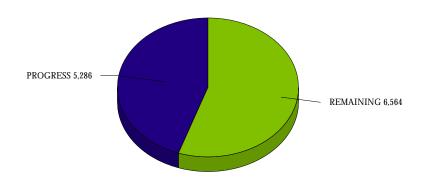
Applied to:

Nitrogen Efficiency: 66 lbs per l.f. reduction **Phosphorus Efficiency:** 40 lbs per l.f. reduction

BMP Rankings:

Ability to Reduce Nutrients: Low **Importance in Statewide Strategy:**

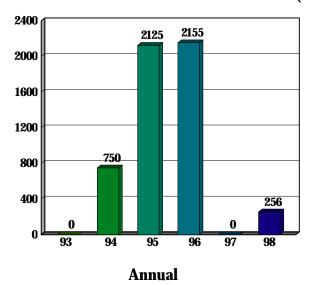
Nitrogen - Medium Phosphorus - Medium

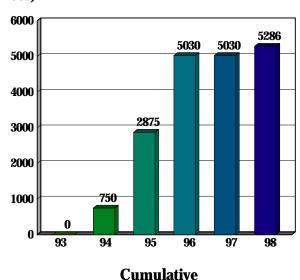


1998 Progress for Nonstructural Shore Erosion Control (as a percentage of TS goal, labeled units are linear feet)

Implementation Record

(linear feet)





NOTES: (1) Implementation data is organized by State fiscal year (i.e. 1994 = July 1, 1993 - June 30, 1994). (2) Most implementation data is based on State program activities, funding and/or requirements. (3) BMP definitions are from "Maryland's Tributary Strategies for Nutrient Reduction" report, 1995. (4) BMP implementation data is from the Maryland Interagecy Tracking Subcommittee. (5) Efficiencies are average statewide efficiencies. (6) Ongoing improvements to the Watershed Model shift the expected reductions of BMPs with efficiencies listed as "land use conversions" slightly.

Structural Shore Erosion Control

TS Goal: 9,102 linear feet

Definition: A practice for stabilizing eroding shorelines using stone riprap or timber bulkheads. Suitable for sites with high wave energy.

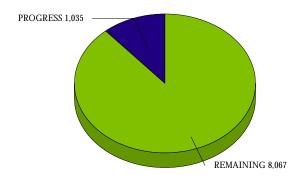
Applied to:

Nitrogen Efficiency: 101 lbs per l.f. reduction **Phosphorus Efficiency:** 67 lbs per l.f. reduction

BMP Rankings:

Ability to Reduce Nutrients: Low **Importance in Statewide Strategy:**

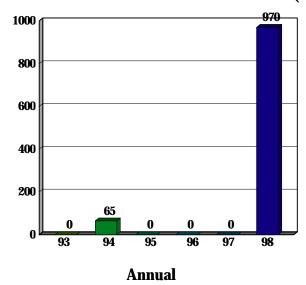
Nitrogen - Medium Phosphorus - Medium

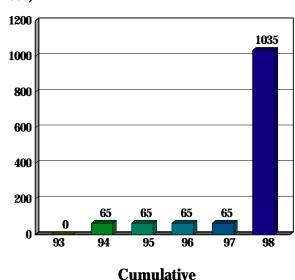


1998 Progress for Structural Shore Erosion Control (as a percentage of TS goal, labeled units are linear feet)

Implementation Record

(linear feet)





NOTES: (1) Implementation data is organized by State fiscal year (i.e. 1994 = July 1, 1993 - June 30, 1994). (2) Most implementation data is based on State program activities, funding and/or requirements. (3) BMP definitions are from "Maryland's Tributary Strategies for Nutrient Reduction" report, 1995. (4) BMP implementation data is from the Maryland Interagecy Tracking Subcommittee. (5) Efficiencies are average statewide efficiencies. (6) Ongoing improvements to the Watershed Model shift the expected reductions of BMPs with efficiencies listed as "land use conversions" slightly.

Tree Planting

TS Goal: 630 acres

Definition: Includes any tree plantings on any site except

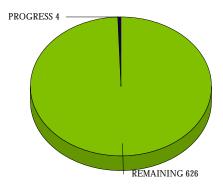
those along rivers and streams. **Applied to:** urban land

Nitrogen Efficiency: 0 reduction **Phosphorus Efficiency:** 0 reduction

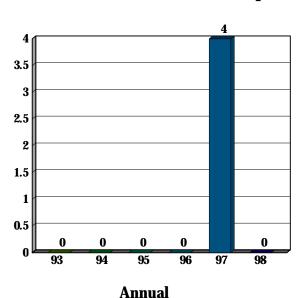
BMP Rankings:

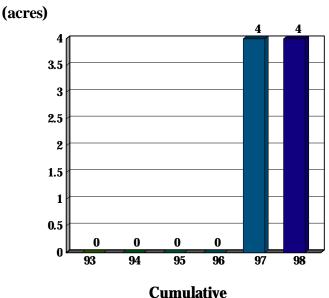
Ability to Reduce Nutrients: Low Importance in Statewide Strategy:

Nitrogen - Low Phosphorus - Low



1998 Progress for Tree Planting (as a percentage of TS goal, labeled units are acres)





NOTES: (1) Implementation data is organized by State fiscal year (i.e. 1994 = July 1, 1993 - June 30, 1994). (2) Most implementation data is based on State program activities, funding and/or requirements. (3) BMP definitions are from "Maryland's Tributary Strategies for Nutrient Reduction" report, 1995. (4) BMP implementation data is from the Maryland Interagecy Tracking Subcommittee. (5) Efficiencies are average statewide efficiencies. (6) Ongoing improvements to the Watershed Model shift the expected reductions of BMPs with efficiencies listed as "land use conversions" slightly.

Enhanced Stormwater Management

TS Goal: 13,617 acres

Definition: The regulatory requirement for the control of Stormwater on all new development, including maintenance on new and existing facilities. Enhancements emphasize water quality controls in addition to water quantity controls.

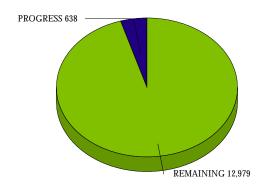
Applied to: urban land

Nitrogen Efficiency: 33% reduction **Phosphorus Efficiency:** 46% reduction

BMP Rankings:

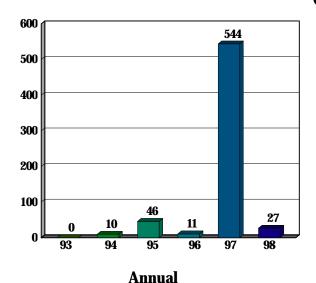
Ability to Reduce Nutrients: Medium **Importance in Statewide Strategy:**

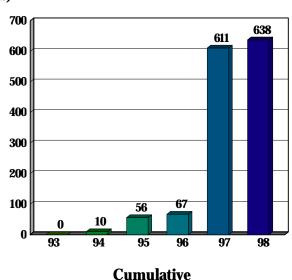
Nitrogen - High **Phosphorus** - Medium



1998 Progress for Enhanced Stormwater Management (as a percentage of TS goal, labeled units are acres)

Implementation Record





NOTES: (1) Implementation data is organized by State fiscal year (i.e. 1994 = July 1, 1993 - June 30, 1994). (2) Most implementation data is based on State program activities, funding and/or requirements. (3) BMP definitions are from "Maryland's Tributary Strategies for Nutrient Reduction" report, 1995. (4) BMP implementation data is from the Maryland Interagecy Tracking Subcommittee. (5) Efficiencies are average statewide efficiencies. (6) Ongoing improvements to the Watershed Model shift the expected reductions of BMPs with efficiencies listed as "land use conversions" slightly.

Erosion and Sediment Control

TS Goal: 1,945 acres

Definition: The regulatory requirement for erosion and sediment control on all new development over 5,000 square feet. Reduces the high nutrient and suspended sediment loads during the transitory construction phase.

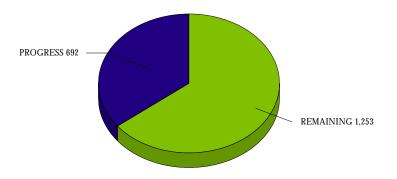
Applied to: urban land

Nitrogen Efficiency: 33% reduction **Phosphorus Efficiency:** 50% reduction

BMP Rankings:

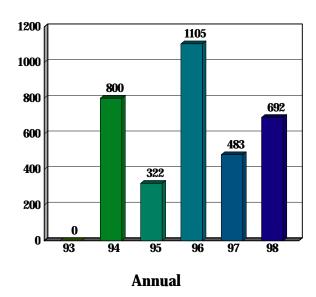
Ability to Reduce Nutrients: Medium **Importance in Statewide Strategy:**

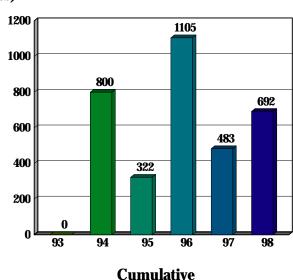
Nitrogen - Medium Phosphorus - Low



1998 Progress for Erosion and Sediment Control (as a percentage of TS goal, labeled units are acres)

Implementation Record





NOTES: (1) Implementation data is organized by State fiscal year (i.e. 1994 = July 1, 1993 - June 30, 1994). (2) Most implementation data is based on State program activities, funding and/or requirements. (3) BMP definitions are from "Maryland's Tributary Strategies for Nutrient Reduction" report, 1995. (4) BMP implementation data is from the Maryland Interagecy Tracking Subcommittee. (5) Efficiencies are average statewide efficiencies. (6) Ongoing improvements to the Watershed Model shift the expected reductions of BMPs with efficiencies listed as "land use conversions" slightly.

Septic Connections

TS Goal: 64 systems

Definition: The connection of failing septic systems to

sewer lines.

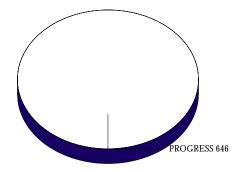
Applied to: urban land

Nitrogen Efficiency: 55% reduction **Phosphorus Efficiency:** no reduction

BMP Rankings:

Ability to Reduce Nutrients: Medium **Importance in Statewide Strategy:**

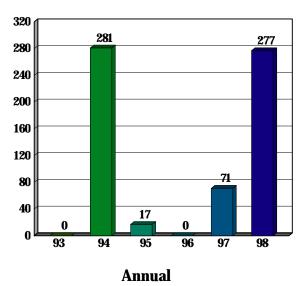
Nitrogen - Medium **Phosphorus** - n/a

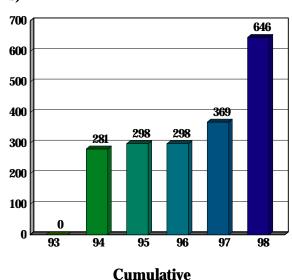


1998 Progress for Septic Connections (as a percentage of TS goal, labeled units are systems)

Implementation Record

(systems)





NOTES: (1) Implementation data is organized by State fiscal year (i.e. 1994 = July 1, 1993 - June 30, 1994). (2) Most implementation data is based on State program activities, funding and/or requirements. (3) BMP definitions are from "Maryland's Tributary Strategies for Nutrient Reduction" report, 1995. (4) BMP implementation data is from the Maryland Interagecy Tracking Subcommittee. (5) Efficiencies are average statewide efficiencies. (6) Ongoing improvements to the Watershed Model shift the expected reductions of BMPs with efficiencies listed as "land use conversions" slightly.

Septic Pumping

TS Goal: 105 systems

Definition: Pumping individual septic systems once every three years, the average routine maintenance of these systems.

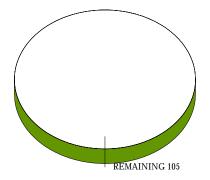
Applied to: urban land

Nitrogen Efficiency: 5% reduction Phosphorus Efficiency: no reduction

BMP Rankings:

Ability to Reduce Nutrients: Low **Importance in Statewide Strategy:**

Nitrogen - Low **Phosphorus** - n/a



1998 Progress for Septic Pumping (as a percentage of TS goal, labeled units are systems)

Implementation Record

(systems)

Annual Cumulative

Stormwater Management Conversion

TS Goal: 136 acres

Definition: Conversion of dry ponds for Stormwater management to extended detention or retention facilities

which are more effective at nutrient removal.

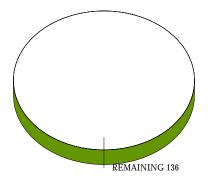
Applied to: urban land

Nitrogen Efficiency: 33% reduction **Phosphorus Efficiency:** 46% reduction

BMP Rankings:

Ability to Reduce Nutrients: Medium **Importance in Statewide Strategy:**

Nitrogen - Low Phosphorus - Low



1998 Progress for Stormwater Management
Conversion
(as a percentage of TS goal, labeled units are acres)

Implementation Record

(acres)

Annual Cumulative

Stormwater Management Retrofits

TS Goal: 329 acres

Definition: Construction of Stormwater facilities on lands

previously developed without such facilities.

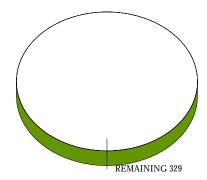
Applied to: urban land

Nitrogen Efficiency: 33% reduction **Phosphorus Efficiency:** 46% reduction

BMP Rankings:

Ability to Reduce Nutrients: Medium **Importance in Statewide Strategy:**

Nitrogen - Low Phosphorus - Low



1998 Progress for Stormwater Management Retrofits (as a percentage of TS goal, labeled units are acres)

Implementation Record

(acres)

Annual Cumulative

Urban Nutrient Management

TS Goal: 988 acres

Definition: A public education program to reduce excess lawn fertilizer use, targeted at suburban residents and

businesses.

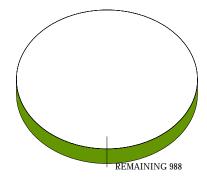
Applied to: urban land

Nitrogen Efficiency: 17% reduction **Phosphorus Efficiency:** 22% reduction

BMP Rankings:

Ability to Reduce Nutrients: Low **Importance in Statewide Strategy:**

Nitrogen - Medium Phosphorus - Low



1998 Progress for Urban Nutrient Management (as a percentage of TS goal, labeled units are acres)

Implementation Record

(acres)

Annual Cumulative